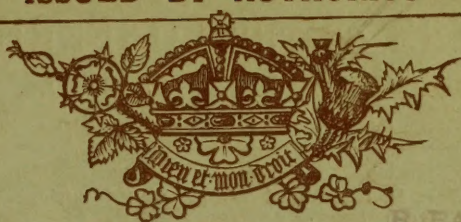


ISSUED BY AUTHORITY



PAPERS OF THE CONFERENCES

Held in connection with

*The GREAT INTERNATIONAL
FISHERIES EXHIBITION*

CRUSTACEANS

BY

THOMAS CORNISH

LONDON

WILLIAM CLOWES AND SONS, LIMITED
INTERNATIONAL FISHERIES EXHIBITION
AND 13 CHARING CROSS, S.W.

PRICE SIXPENCE

QL
435
C818
1883
FISH



PAPERS OF THE CONFERENCES

*Held in connection with the GREAT INTERNATIONAL
FISHERIES EXHIBITION.*

NOW READY.

Demy 8vo., in Illustrated Wrapper. Price Sixpence each.

INAUGURAL MEETING: ADDRESS. By Professor HUXLEY, P.R.S.
H.R.H. the PRINCE OF WALES (President of the Commission) in the Chair.

**NOTES ON THE SEA FISHERIES AND FISHING POPULATION
OF THE UNITED KINGDOM.** By H.R.H. THE DUKE OF EDINBURGH, K.G. 1s.

THE FISHERY INDUSTRIES OF THE UNITED STATES. By Professor BROWN GOODE, M.A.

**OYSTER CULTURE AND OYSTER FISHERIES IN THE NETHER-
LANDS.** By Professor HUBBRECHT.

PRINCIPLES OF FISHERY LEGISLATION. By Right Hon. G. SHAW-
LEFEVRE, M.P.

**ON THE CULTURE OF SALMONIDAE AND THE ACCLIMA-
TISATION OF FISH.** By Sir JAMES RAMSAY GIBSON MAITLAND, Bart.

FISH DISEASES. By Professor HUXLEY, P.R.S.

THE ECONOMIC CONDITION OF FISHERMEN. By Professor LEONE
LEVI.

THE FISHERIES OF CANADA. By L. Z. JONCAS.

**PRESERVATION OF FISH LIFE IN RIVERS BY THE EXCLU-
SION OF TOWN SEWAGE.** By the Hon. W. F. B. MASSEY MAINWARING.

MOLLUSCS, MUSSELS, WHEELKS, &c., USED FOR FOOD OR BAIT.
By CHARLES HARDING.

COARSE FISH CULTURE. By R. B. MARSTON.

ON THE FOOD OF FISHES. By Dr. F. DAY.

THE HERRING FISHERIES OF SCOTLAND. By R. W. DUFF, M.P.

LINE FISHING. By C. M. MUNDAHL.

FISH TRANSPORT AND FISH MARKETS. By His Excellency SPENCER
WALPOLE.

**FOREST PROTECTION AND TREE CULTURE ON WATER
FRONTAGES.** By D. HOWITZ, Esq.

SEAL FISHERIES. By Captain TEMPLE.

FISH AS FOOD. By Sir HENRY THOMPSON.

STORM WARNINGS. By R. H. SCOTT.

**ON THE DESTRUCTION OF FISH AND OTHER AQUATIC
ANIMALS BY INTERNAL PARASITES.** By Professor COBROLD, F.R.S., F.L.S.

SCIENTIFIC RESULTS OF THE EXHIBITION. By Professor E. RAY
LANKESTER.

A NATIONAL FISHERY SOCIETY FOR GREAT BRITAIN. By
C. E. FRYER.

CRUSTACEANS. By T. CORNISH.

IN THE PRESS.

SALMON AND SALMON FISHERIES. By DAVID MILNE HOME, F.R.S.E.

PILCHARD AND MACKEREL FISHERIES. By T. CORNISH.

FRESH-WATER FISHING (other than Salmon). By J. P. WHEELDON.

ARTIFICIAL CULTURE OF LOBSTERS. By W. SAVILLE KENT.

THE BASIS FOR LEGISLATION ON FISHERY QUESTIONS. By
Lieut.-Col. F. G. SOLÁ.

TRAWLING. By ALFRED ANSELL.

**ON FACILITIES FOR THE IMPROVED CAPTURE AND ECO-
NOMIC TRANSMISSION OF SEA FISHES, AND HOW THESE MATTERS AFFECT
IRISH FISHERIES.** By R. F. WALSH, of Kinsale.

THE FISHERIES OF IRELAND. By J. C. BLOOMFIELD.

THE FISHERIES OF OTHER COUNTRIES. By Commissioners for
Sweden, Norway, Spain, &c., who took part in the Conference.

LONDON: WILLIAM CLOWES & SONS, LIMITED,
INTERNATIONAL FISHERIES EXHIBITION, & 13, CHARING CROSS.

QL

435

C818 *International Fisheries Exhibition*

1883

FISH

LONDON, 1883

R. RATHBUN

CRUSTACEANS

BY

THOMAS CORNISH

!!!



LONDON

WILLIAM CLOWES AND SONS, LIMITED

INTERNATIONAL FISHERIES EXHIBITION

AND 13 CHARING CROSS, S.W.

1883

CONFERENCE ON MONDAY, JULY 23, 1883.

MR. JOHN TREMAYNE in the Chair.

CRUSTACEANS.

I HAVE been requested to read to you a short Paper on "Crustaceans."

The Crustaceans are a large class of articulated animals whose distinguishing feature to the mere outside observer is that they are covered over the whole of their bodies and legs by a shell of more or less hardness, and it is this total covering in a coat of mail which mainly sets them apart from other classes of animals.

They are found on the land, in the fresh water, and in the salt water : and, amongst themselves, are divided into two distinct varieties, ie., the "Sessile-eyed" crustacean, in which the eye lies flat in its socket, with just the amount of mobility and scope of vision which the eyes of most animals have ; and the "stalk-eyed" crustaceans, in which the animal has a certain limited power of projecting its eye, at its own will, beyond its socket or immediate surroundings, and so obtaining a considerably enlarged sphere of vision.

With the single exception of the common river cray-fish I shall confine myself to-day to the crustaceans whose home is in the sea.

Among these I shall very curtly dismiss the "Sessile-

eyed" class, with the remark that no one of them has any interest for us except from a scientific point of view. Practically, so far as they affect us at all, they are objectionable. To them belong the "Hoppers" which make our beaches, and especially those on which sea-weed is apt to accumulate, unbearable on a hot summer's day, and as well that curse of the fisherman who uses trammel nets, one of the *gammaridæ* which, in countless numbers, will clean to the bone, within eight hours, a fish caught in the net, and send it up as white and neat as ever the Royal College of Surgeons set up a skeleton.

I think I may say that so far as the word "crustacean" conveys any definite idea to the minds of the majority of those here it carries the meaning of "crabs and lobsters;" and I take these animals, which are not unimportant as sources of food supply, with the addition of prawns and shrimps, and their congeners, as the subject of my present paper.

If you will look at the next lobster, or crab, or shrimp, which you may see, you will, with the delicate use of a fork in the case of a boiled specimen, find that it has, or had, an eye placed at the top of a stalk, or pedestal, based within the socket of the eye on a moveable mechanical joint, and there receiving the usual information from the brain of the creature through the nerves. You will find that the socket of this eye is invariably protected by spines of a strength proportionate to the size of the creature, and that this eye can be projected or retracted at the will of the shell fish. It resembles in some respects the telescopic eye of the snail, but it is not capable of anything like the same protrusion nor is it so mobile. In the "shrimps" the eye at its full protusion and elevation rises above the level back of the animal to an extent which enables it to see all round it.

Any one who has watched a shrimp in a small pool of salt water will acknowledge this. Most shrimps are so semi-transparent in water that it requires a practised eye to observe them, but, once see a shrimp leisurely making its way across a pool, thinking of nothing at all, and alarm that shrimp by putting your walking stick in front of it, and you will at once (but to see this you must have learned to watch nature closely) see it raise its little black eyes, take a rapid view of the ground in its rear, and with one flip of its tail disappear stern foremost into the hole it has selected for its place of refuge.

The arched back of the crabs and lobsters prevent the same thing occurring in their cases, but they yet derive a very greatly increased scope of vision from their power of thus protruding their eyes. Quite recently a specimen of a little lobster-like creature, *Scyllarus arctus* (it is so rare in English waters, except in Mount's Bay, that it has no English name) has come into my possession which I have preserved and have with me. It is worthy of notice, not only because its eye is an exceedingly good example of the "stalk-eye," but because I believe only three specimens (two off Plymouth and one from the stomach of a cod taken off Polperro) have been seen in England out of Mount's Bay. In that bay I have secured some twenty specimens, many alive and full of spawn ready to be shed, as was the case with the specimen I have with me. There is reason to believe that it was observed in Mount's Bay so long ago as the middle of the last century; but it is distinctly a crustacean of the Mediterranean Sea.

Confining myself now to these stalk-eyed crustaceans of the sea, I may say that something over one-hundred species have been recorded as having been observed in British waters. A large proportion of these, perhaps one half, are

of the small shrimp and prawn order, which are not carefully looked after, except by naturalists making the study of them their speciality. Of the others (to which I have given much practical attention) I have captured in Mount's Bay with my own hands certainly four fifths of the species known to exist, including many of the rarest specimens occurring in our seas.

I may explain that the reason why I have seen so many species of crustaceans more than my neighbours is that I have fished for them myself. Most of the sea crustaceans are small and considered valueless. This is a misapprehension, nearly all of them yielding dainty food; but the fisherman is intensely conservative in his instincts, and it is a very difficult thing to get him to preserve a crab or a lobster or any of the class which has not already established itself as an edible and saleable commodity. To begin with, they are all his natural enemies. Unless they are caught in the legitimate crab-pot, from which all small specimens can escape, they are taken in his nets. They come into the net in pursuit of the best fish caught in it, and they get entangled. So long as they have life they are using their claws to cut the cords of the net, and so it happens that every crustacean does damage to the net which captures it. The fisherman, intent on his better fish, never waits to disentangle a crab of any sort unless it is a valuable one. He simply wrenches off its legs or lays it, in the net, on the gunwale of the boat and smashes it with his hand to deprive it of the power of doing further mischief, and goes on with the hauling of his net. Thus, rare crustaceans are rarely recognised. I have had in the last thirty years constant opportunities of reversing this process, and of carefully picking out of my nets thousands of little crabs which would have been passed without notice by the

ordinary fisherman: and consequently, partly on that account, and partly on account of the situation of Mount's Bay, I have seen more species of marine stalk-eyed crustaceans than most people.

As the typical "stalk-eyed" crustaceans of our British waters you may take the common lobster, the common crab, and the cray-fish (either salt water or fresh water—it does not matter which). You know about the size of these. The largest crab on record weighed something over 13 lbs., and its preserved shell is now in Mr. Laughrim's collection in the Natural History Department of this Exhibition. The largest lobster (the specimen is in the same place) weighed something short of 12 lbs.* The sea cray-fish is, to look at, a larger animal than either the crab or the lobster, but, having no large claws, always turns out of lesser weight size for size.

But what are these puny creatures to the stalk-eyed crustaceans of other days! I do not now refer to the sprawling spider crab exhibited in the Japanese Department of this building, and which measures I believe, ten feet from finger tip to finger tip; but to that huge, solid lobster-like crustacean disclosed to us by geological research, and which must have been some eight feet long in the body, and have contained meat enough to make a salad for a regiment of soldiers!

Still, as we only have these little specimens left, we must do the best we can with them; and the first thing to which I will call your attention is a matter which strikes the observer last of all. You probably know that crustaceans are propagated from eggs which, whilst in the body of the lobster, or cray fish, are found in the form of "coral," but

* There is a specimen of a Lobster in the Fishmarket, I.F.E. which weighed over 20 lbs., but it is from America.

which when further developed appear outside in the form of "berry." In this latter form you also find them in the crab. From these eggs are hatched some wonderful little creatures of intense activity, resembling nothing so much as the animalculæ shown by the microscope in a drop of ditch water. They are as unlike the shellfish they are to become in mature life as a grub is unlike a butterfly, and, curiously enough, they are sessile-eyed.

I will now go on to the lives of the crustaceans after they have assumed their final shape. They all are much of the same size when extruded from the egg; but at maturity they vary from the "common Pea-crab" or from "Andrews's Galathea," either of which at its full maturity can be placed on a threepenny bit and leave an ample margin, up to the largest of our lobsters, crabs, and crayfish. When I was learning these matters the late Professor Bell used very kindly to allow me to send to him for identification any specimens about which I had any doubt, and in 1864 I procured from the submerged part of a deep sea buoy specimens of two very tiny crabs, neither of which was more than $\frac{1}{4}$ inch across the back. One, I thought, I identified as *Eurynome aspera* a crab so rare that I dared not mention it on merely my own authority. The other I could not make out at all, so I sent both to Professor Bell. To my extreme delight he told me I had *E. aspera* in its young, but final, form, but he took all the pride out of me by pronouncing the second specimen to be a young common crab. I mention this to show how tremendously this latter crab increases in size and bulk.

And as to this question of bulk. The stalk-eyed crustaceans are, as we have considered, enveloped in a hard and non-elastic coat of mail. We have seen that they increase enormously in size. How then do they grow? They grow

in this way : Once in every year, and, of the same species, at the same time in every year, the crab or lobster, or crayfish or shrimp, instinctively retires to some lonely hole in the rocks, and mopes until a crack in the shell occurs across it, precisely where the carapace or back ends, and the tail begins. So soon as this happens the animal begins to drag its whole self out of the shell. In from half an hour to an hour it has drawn the flesh of its great claws out of their shells through the little wrists, and has even drawn its eyes out of their protecting cases or pedestals, and has cleared itself of its old shell altogether, and it lies beside it a perfect crab, or whatever else may be its shape, but quite soft and shell-less, and apparently exhausted. The empty shell also retains its perfect shape ; but a comparison of the two shows you at once how the growth takes place. The real crab is sizes larger than its late shell, and in about a week a new shell has hardened over it, and this process is repeated yearly, as I have said, until a period of age comes at which it apparently ceases, and the creature grows no more. We judge this because we find that our very largest specimens are always covered with corallines of very slow growth.

Probably most of you consider of a crab or lobster as you see it on a fishmonger's stall, a squat thing with its legs sprawled out. But they are very different when alive and in the sea. Then those long legs are in their proper position, and the shell-fish walks on them daintily, with its long antennæ or feelers out in constant motion searching for its food. The lobster is a foul feeder, and prefers its food in a state of putridity, or at all events, not fresh ; but the crab will touch nothing that is not fresh. Any of you acquainted with the working of aquariums may be able to correct me in this statement ; but I make it from my

practical knowledge of the baits we use in fishing for crabs and lobsters. In each case we use fish bait. I once discovered a benighted little fishing cove where the fishermen actually commonly used large turbot and red mullet—a pound and a half and over in weight—for bait for crab. They had no market for turbot and red mullet, whilst they had for their crabs and lobsters. Having, of course, much finer gear with me than they used, I very soon harried the inshore sands, and established a barter market in which one turbot of good size was exchanged for one ray of any size, and a small ray equalled a good red mullet. When ray were scarce with me, the market price of a turbot was 1s., and that of a red mullet 6d.

To this question of the bait offered to—which means, of course, the favourite food of—some crabs, I can offer another illustration. The red mullet which we catch are taken in fixed-bottom fishing nets called trammels, and the fish caught in these nets frequently remain for many hours before they are taken out, and we find that crabs, and especially the spider crab—our English representative of the gigantic crab in the Japanese Court, of which I have made mention—always attack the liver, the dainty part of a red mullet, first. Sometimes they eat more of the fish; but the liver invariably suffers first. We know this because from the peculiar formation of the net the attacking crab is almost invariably captured with its prey.

But this fact of the preference of crabs and lobsters for soft bait suggests another question. If the food which they preferentially seek is of this soft nature why should they be furnished with claws of such tremendous cutting and crushing power? Every crab and every lobster is furnished with a claw (the smaller one) adapted for cutting as scissors do, and another, the larger one, adapted for crushing; and

between these two claws they can tear every bit of food they capture into little fragments and feed themselves with it, literally "from hand to mouth." It is a very pretty sight indeed to see the tiny *Galathea Andrewsii*, of which I spoke just now, kept in the holes of a clinker, in a soup plate filled with salt water, come out of their holes when the water is stirred, and feed themselves with particles of food utterly invisible to the unassisted eye, by capturing some passing bit of food in their elegant little claws and conveying it to their mouths, precisely as we should do with a cherry or bit of biscuit. Crustaceans are slow of movement, and may have to feed on things of a much harder nature than the bait with which we fish for them. This may explain the necessity for their having such powerful hands, for their claws are but hands. But then, as they are an exceedingly pugnacious class of beings, it may be that the extraordinary power given to their hands is needed for belligerent purposes. A crab will fight anything. I have seen a captured crab seize a captured picked dog-fish by the tail, and the dog-fish, striking backwards, as is its wont, make its spines "click" (ineffectually of course) on the back of the crab repeatedly ; until the crab got a grip with its other claw on the dog-fish's throat, and then the battle was over. Of course a crab, size for size, is much harder and more powerful than a lobster. I have seen a crab, in conflict with a lobster, catch the latter over the forepart of the head, where its shell is hardest, and crush it in by one effort. No lobster could do this to a crab fairly its equal in size. And it rather bears out my idea that the claws of these creatures are weapons of war rather than means of providing themselves with food, that the moment any one of them receives severe injury in a claw it "shoots" it, that is, it deliberately

severs the connection of the claw with the body at the shoulder—the joint next the body—by an act of its own will, and that Nature regularly and repeatedly (but on each occasion with less effect) reproduces the claw on a smaller scale than the one shot off. It seems probable that if the large claw was necessary to the feeding of the animal Nature would rather seek to cure an injury to it than let the animal discard it altogether; but the crab makes no two ways about it. Within a second of the injury received the whole limb is discarded; and lobsters are much more apt to do this than crabs. This known difference in the temper of the two came out once very funnily whilst I was fishing. We value lobster much more than we do crab. A crab, when it catches you, holds on with a crush much harder than does the lobster. An old boatman of mine once, whilst landing a lobster, got caught by it over the thumb. Any violent act of resentment would have made the lobster shoot its claw; and I looked round just in time to see the boatman balancing the lobster up and down from the gunwale of the boat, bearing the pain of the pinch, and apostrophising it with “Ef thee’d a-ben a crab I’d ha’ smashed thee agen the gunnel.”

But, having dealt with the food of crustaceans, we will deal with the crustaceans as food. Many of the smaller species—all, in fact—are utilised as food by fish of several species (families, I may say). Thus the family of the cod (*Gadidæ*), and of the flat-fish (*Pleuronectidæ*), feed largely on stalk-eyed crustaceans, and so, indirectly, make them available to us as food. So well is this fact known amongst those interested in the subject that no one of them would permit the stomach of a cod or a dorse, and some other allied species, to be thrown away without a careful overhauling first. The first recorded specimen of the rare

crustacean, *Scyllarus arctus*, to which I have alluded was found by my friend the late Mr. Jonathan Couch in the stomach of a cod. The only specimen I ever saw of a crab called the long-legged portunus (*P. longipes*) I obtained from the stomach of a dorse. But specimens thus obtained are of course not available to us as food. We have recognised the value of the larger species, and passed no end of laws to protect them in their earlier stages. For about three families we have made close times and size-rules, and all the rest of it. I do not know but that in some districts these things may be beneficial, but I do know that the Commissioners who inquired into the matter found that there existed off the Land's End one solid bed of crab and lobster deep-sea fishing ground of at least 200 square miles in extent; and they thought, and I think with them, that it will take a good many centuries to exhaust that field by any method of fishing. The crustaceans of that district and the coal of England will be exhausted much about the same time. I am not aware that any fishing ground approaching this in extent exists elsewhere in Great Britain, and I approve of the legislation which has taken place. Where the area of production, and therefore the area of fishing, is limited, protection is absolutely necessary if the efficiency of that particular fishery is to be maintained. By actual experiment I have ascertained that a common edible crab (*Cancer pagurus*) measuring three inches across the carapace, or back, turns out one ounce and a half of meat available for food, whilst a crab of four inches across the carapace (a size which a three-inch crab would probably attain in its next year of growth) turns out four and a half ounces of meat available for food. Clearly therefore the young crab should be protected, but the enforcement of protection by law is very difficult. It

might be otherwise if the men who fish limited areas could be made to understand that in the long run close protection will prove their best friend.

We are eating these large crustaceans as luxuries, and we are eating shrimps and prawns as dainties ; but between these two there exist several species of crustaceans which attain maturity at a size of from three to five inches across the back which we never think of eating, but which yet are full of excellent meat. We make a delicacy of the river crayfish, but we despise, or rather utterly ignore, the spider crab, the shore crab, the two larger *Xanthos*, the velvet swimming crab, the *Galatheas* (squat lobsters) and many others—including the one, *Scyllarus arctus*, which I have mentioned, but which must, in the present state of our knowledge about it, be treated as of very local permanent occurrence in our seas ; other observers than myself, placed by my experience on the scent, may establish it as a common inhabitant of our waters. Of all of those, untold stores might be captured along all our rocky sea-shores, and all of them yield good food in larger quantities, and with not much more trouble, than would an average prawn. We do not trouble about them, and their capture is, as I have shown, a chance affair ; but go to the Japanese Department, or the Chinese, or even to our own Department of Speculative Ideas in this building, and see what endless pots and models of pots and traps there are exhibited there, designed on purpose to catch prawns and shrimps, but which would also catch these wasted treasures of the sea, if they were looked after.

This waste of food supply is due to two causes—one is that the “men that know” (the scientific naturalists) take no measures to reduce their knowledge into practice. And the other is that the “men that work” (the fishermen) are

naturally, as I have said, unwilling to save sea produce which is worse than useless to them without a market. This remark applies equally to enormous quantities of fish which are captured constantly in ordinary trawling, and, because they are strangers to the fishermen and will not find a market, are thrown overboard as useless. It is not quite germane to my subject, but if it were I could dilate on scores of species of fish constantly taken in our seas, excellent as food, and thrown overboard simply because, being unknown, they would find no sale. If this Exhibition can, as one only result, break down the arrangements which keep good and cheap, but comparatively rare, fish out of the public markets, and so cause the demand which can and will create a supply, it will have conferred a very great boon on the English public; and I do not see why it should not do it. I have never yet seen a fish that is unfit for food, if in good condition at the time of its capture; and in saying this, I am saying much, for I have made it a rule to have cooked the second specimen of any rare fish which I get. The first is of course set up for some museum.

There is another thing about our smaller crustaceans which is worthy of notice. Some of our little crabs—and I dare say more in other species than I have noticed—give us notice in spring of the fish which we may expect in autumn. For instance the occurrence in free numbers in April of a small crab known, as the “masked” or “old man” crab (*Corystes cassivelaunus*) in particular localities always assures us that about August we shall in the same locality get an abundance of plaice, and soon after that large red mullet. When I say large red mullet I speak of fish weighing from 42 oz. (the heaviest ever recorded in British seas, and taken in Mounts Bay) to 25 oz., and thence to 16 oz. At this time these facts are to us coincidences,

and nothing more ; but if they were closely followed up by many observers, they would produce for us more good fish than we get on our present haphazard principles.

I spoke just now of the very combative nature of some of the stalk-eyed crustaceans. The species that most excel in this quality are the soldier or hermit crabs. Their first idea of independent life is to eat some friendly whelk, and occupy its shell. Their next is to give battle to every crab of the same persuasion as themselves that they come across ; and altogether they form, as you can see in any aquarium, the most quarrelsome and most amusing set of crustaceans in existence.

It may seem utterly absurd to speak of these hard-shelled crustaceans as capable of suffering from skin-disease, but it is nevertheless the fact that they are so. Under certain circumstances, of which we know nothing, a peculiar cancerous eating out of the outer part of the back and claws takes place, spreading irregularly like a map over the crustacean, and showing a black colour. Shell-fish thus attacked are known as "pocked" crabs or lobsters, and are unfit for food ; but I need not labour this point further, because I know of no fisherman who would send a crab of this sort into the market.

One more statement of a fact (some people might call it an anecdote) and I have done. Most of you probably know that on a dark summer's night the water of the sea, to the depth of as much as twenty fathoms, is from some cause or another luminous when disturbed. When this phenomenon occurs, a fishing line can be traced down its whole length, and a fish caught at the bottom of the sea comes struggling and sprawling up in a blaze of phosphorescent light. I was once fishing in about fourteen fathoms of water, when I hooked a fish. I hauled it up, making as it came a most pro-

digious luminosity. When it came alongside, my boatman struck at it with the gaff, and off from amidst the mass of phosphorescent light the iron gaff came with a click. He struck again with the same result. And he said, "This thing is not right, master; let it go." I did not. I gave a dead haul, and got aboard a very large sprawling cray-fish. It was not, as my boatman had supposed, a direct emanation from the regions below.

DISCUSSION.*

Mr. KENNETH CORNISH, after some remarks on the value of fish as food, having particular reference to a paper read by Sir Henry Thompson at a previous Conference, was going on to describe an improved method which he had adopted for cooking food, when he was reminded by the Chairman that the special subject of the Conference that day was crustaceans. He said he would not detain the meeting, but had also devised a method for preserving fish in the form of powder, by which the whole of the nutritive constituents were preserved, including the albumen.

Mr. BIRKBECK, M.P., then moved a vote of thanks to Mr. Cornish and to Mr. Saville Kent for their interesting Papers, which had contained a deal of information which was probably new to many persons present. Mr. Cornish had told them of a remarkable fishing ground on the coast of Cornwall, which might be safely fished without any restrictions, whilst on the other hand Mr. Saville Kent had given statistics proving that the supply

The following discussion and motions carried, refer in part to a Paper that was read the same afternoon by Mr. W. Saville Kent, on the subject of "Artificial Culture of Lobsters."

of lobsters was apparently decreasing rapidly. He might say that on the coast of Norfolk there was a small lobster and crab fishery on a ground of about fourteen miles in length by three to four miles in breadth, which many years ago was a very productive fishery, but unfortunately the practice of breaking up small crabs for bait, and also the practice of sending to market berried hen lobsters, was carried on to such an extent that the fishery was reduced really to nothing. He was asked to institute a Board of Trade inquiry, and the late Mr. Buckland and Mr. Spencer Walpole came down and held it; the result being that an order was passing putting a stop to the capture of berried hen lobsters and also the soft crabs, and the fishermen were strongly advised to stop the breaking up of small crabs for bait. That order was in force for three years, and when it expired, which was on the 1st of February this year, another inquiry was held by the Board of Trade, under the supervision of Professor Huxley. The evidence which was given, not only from the fishermen, but the salesmen, was so convincing as to the effect of the order being to increase the supply to four or five times what it was previous to the order being passed, that the Board of Trade had now passed an order putting a stop to the practices which were in vogue for ten years, and the fishermen had made up their minds that they would endeavour to get a local Act passed to put a stop entirely to the breaking up of small crabs. That showed what could be done in a small district, and he hoped it would be carried out throughout the country.

Mr. BRADY had much pleasure in seconding the resolution. He did not know that there was any question more interesting than that of crab and lobster fisheries,

unless it was the artificial cultivation and production of salmon and trout. He quite agreed with Mr. Saville Kent on the great importance which would be derived from the artificial cultivation of these fish in the same way as salmon and trout, but he did not follow him so far as to think that the same instruments or conveniences could be used for one as were used for the other, inasmuch as one must be carried on near the sea, and the other far inland. With regard to the cray fish, he agreed with him it could be done, but that was only a matter of detail. He feared, however, it would be like other matters which were for the public good, that it would be hopeless to expect private individuals to undertake it. This subject, along with the artificial propagation of the better species of fish, and probably, eventually they might come to that, was a matter which concerned the State more than private individuals, and he thought it would be found very difficult to find private gentlemen so scientific as to go to the very large expense which would be required, without any certainty of recouping themselves or obtaining interest on the money.

The resolution was carried unanimously.

Mr. CORNISH, in reply, having thanked the meeting, said he would make one remark on Mr. Saville Kent's paper, that was with regard to the use of the berry of the lobster. If they could only bring it home to the minds of cooks that the berry of the lobster was absolutely tasteless, or if it had any taste at all it was a slightly unpleasant taste of iodine, and that, therefore, it was only valuable as a colouring matter, there might be some hope of putting a stop to the present practice of using it for sauce. He then proposed a vote of thanks to the Chairman for his kindness in taking the chair. He had

known him for some years as a practical fisherman, and he was sure a better chairman could not have been selected.

Mr. SAVILLE KENT seconded the motion, which was carried unanimously.

The CHAIRMAN said he could assure the Conference it had given him great pleasure to be present that day, because this question of crustaceans was one which must interest every one. The lobster and crab fisheries had always had a peculiar interest to him, because it was essentially a fishery for poor men. The crabbers generally worked with their own hands almost, and in their own little boats, and were exposed to almost as hard work as any toiler of the sea, so that anything which could be done to protect their interests, or increase the supply of this fish, would be most valuable to the fishing community. With regard to what had been said about legal interference, he might say that in 1877 an Act of Parliament was passed to a certain extent protecting crabs and lobsters, by prohibiting the sale of undersized fish. The question of berried hens, as they were called, was very much discussed when that Act was passed, and he took a great deal of trouble to get information and evidence with regard to them. It was not the cooks alone who were to blame in causing berried hens to be sent so largely into the market, the fishermen themselves doing it, because the lobsters having berries on them were in as good condition for eating as at any time in the year, and if the sale of berried hens were to be prohibited, as Mr. Kent remarked, and as he had heard from the fishermen themselves, they would simply evade the law by brushing off the berries. The size of crabs was another question which was very largely discussed, and, as Mr. Birkbeck could bear him out, the people

in Norfolk, where crabs were not as large as on the south and west coasts, were in favour of a larger size being named than that which was placed in the Act, viz., $4\frac{1}{4}$ in. across the crab's back. That was such a tiny thing, and contained so little meat, that a very small extension in the size would produce much more valuable food for the table, and the fish would increase its species in an enormously large proportion. With regard to the district which Mr. Cornish had spoken of, where fishing could be carried on for over 200 square miles without doing any harm, he would point out that there was a great natural protection existing there, for that fishing ground was exposed to all the tremendous rollers of the Atlantic Ocean, so that it could not be fished so constantly and incessantly as inshore crab fisheries, and those places around the shore where it was acknowledged on all hands that crab and lobster fisheries required protection.

LONDON:
PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,
STAMFORD STREET AND CHARING CROSS.

Microformed by
Preservation
Services

mfm # 6073.08

5/95

OFFICIAL PUBLICATIONS
OF THE
INTERNATIONAL FISHERIES EXHIBITION,

PUBLISHED BY

WM. CLOWES & SONS, Limited, 13, Charing Cross, S.W.

(And Sold at their Stalls near each Entrance to the Exhibition.)

OFFICIAL GUIDE BOOKS, &c.

**LARGE PLAN and TOUR of the BUILDINGS, 1d. ;
post-free 1½d.**

GUIDE to the EXHIBITION, 3d. ; post-free 4d.

PROGRAMME of MUSIC, &c., 2d. ; post-free 3d.

OFFICIAL CATALOGUE, Second Edition, 1s. ; post-free 1s. 4d.

**CHEAP RECIPES for FISH COOKERY. Prepared
by Mrs. CHARLES CLARKE. 3d. ; post-free 4d.**

THE FISHERIES PORTFOLIO :

CONTAINING

Ten Original Etchings of Scenes on the British Coast.

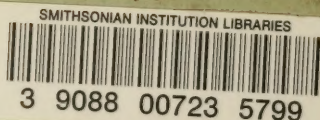
TITLE.	ARTIST.
1.—Bait Gatherers	R. W. MACBETH, A.R.A.
2.—Running Ashore	COLIN HUNTER.
3.—A Fisher Girl	J. D. WATSON.
4.—Fishing Boats off Hastings . .	DAVID LAW.
5.—Going for Bait	OTTO LEYDE, R.S.A.
6.—Boat Building on the Yare . .	C. J. WATTS.
7.—Preparing for Sea—Hastings .	C. P. SLOCOMBE.
8.—Ramsgate Harbour	J. P. HESELTINE.
9.—Fisherman's Haven	J. MACWHIRTER, A.R.A.
10.—Stranded—Rye.	WILFRID W. BALL.

Price 15s. the complete set.

LONDON : WILLIAM CLOWES & SONS, LIMITED,
INTERNATIONAL FISHERIES EXHIBITION, & 13 CHARING CROSS.

OFFICIAL PUBLICATIONS.

The following
International Fi
or in active prep



gnate to the
ly published,

Demy 8vo., in Illustrated Wrapper 1s. each ; or bound in cloth 2s. each.

THE FISHERY LAWS. By FREDERICK POLLOCK, *Barrister-at-Law, M.A. (Oxon.), Hon. LL.D. Edin. ; Corpus Christi Professor of Jurisprudence in the University of Oxford.*

ZOOLOGY AND FOOD FISHES. By GEORGE B. S. *Professor, Demonstrator of Biology, Normal School of Science, and Royal School of Fisheries, South Kensington.*

BRITISH MARINE AND FRESHWATER FISH. *(Illustrated.)* By W. SAVILLE KENT, F.L.S., F.Z.S., *Author of Official Guidebooks to the Brighton, Manchester, and Westminster Aquariums.*

APPARATUS FOR FISHING. By E. W. H. HOLDSWORTH, F.L.S., F.Z.S., *Special Commissioner for Juries, International Fisheries Exhibition ; Author of "Deep Sea Fisheries and Fishing Boats," "British Fisheries—Sea Fisheries," &c.*

THE BRITISH FISH TRADE. By His Excellency SPEAKER WALPOLE, *Lieut.-Governor of the Isle of Man.*

THE UNAPPRECIATED FISHER FOLK. By JAMES G. BERTRAM, *Author of "The Harvest of the Sea."*

THE SALMON FISHERIES. *(Illustrated.)* By C. E. FRYER, *Assistant Inspector of Salmon Fisheries, Home Office.*

SEA MONSTERS UNMASKED. *(Illustrated.)* By HENRY LEE, F.L.S.

THE ANGLING CLUBS AND PRESERVATION SOCIETIES OF LONDON AND THE PROVINCES. By J. P. WHEELDON, *late Angling Editor of "Bell's Life."*

IN THE PRESS.

THE HISTORY OF FISHING FROM THE EARLIEST TIMES. By W. M. ADAMS, M.A. (Oxon.), *late Fellow of New College.*

FISH CULTURE. *(Illustrated.)* By FRANCIS DAY, F.L.S., *Commissioner for India to International Fisheries Exhibition.*

FISH AS DIET. By W. STEPHEN MITCHELL, M.A. (Cantab.)

ANGLING IN GREAT BRITAIN. By WILLIAM SENIOR (*"Red Spinner"*).

EDIBLE CRUSTACEA. By W. SAVILLE KENT, F.L.S., F.Z.S., *Author of Official Guidebooks to the Brighton, Manchester, and Westminster Aquariums.*

INDIAN FISH AND FISHING. *(Illustrated.)* By FRANCIS DAY, F.L.S., *Commissioner for India to International Fisheries Exhibition.*

THE LITERATURE OF SEA AND RIVER FISHING. By JOHN J. MANLEY, M.A. (Oxon.)

SEA FABLES DISCLOSED. By HENRY LEE, F.L.S.

FOLK LORE OF FISHES: *their Place in Fable, Fairy Tale, Myth, and Poetry.* By PHIL ROBINSON.

THE OUTCOME OF THE EXHIBITION. By A. J. R. TRENDLELL, *of the Inner Temple, Barrister-at-Law, Literary Superintendent for the Fisheries Exhibition.*

LONDON :

WILLIAM CLOWES AND SONS, LIMITED,
INTERNATIONAL FISHERIES EXHIBITION, & 13, CHARING CROSS.